

Results of the Iowa DNR Animal Feeding Operations Odor Study

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Monitoring Group**



459.207 Animal Feeding Operations -- Airborne Pollutants Control

1. As used in this section, unless the context otherwise requires:
 - a. "Airborne pollutant" means hydrogen sulfide, ammonia, or odor.
 - b. "Separated location" means a location or object from which a separation distance is required under section 459.202 or 459.204, other than a public thoroughfare.
2. The department shall conduct a comprehensive field study to monitor the level of airborne pollutants emitted from animal feeding operations in this state, including but not limited to each type of confinement feeding operation structure.



459.207 Animal Feeding Operations

-- Airborne Pollutants Control (continued)

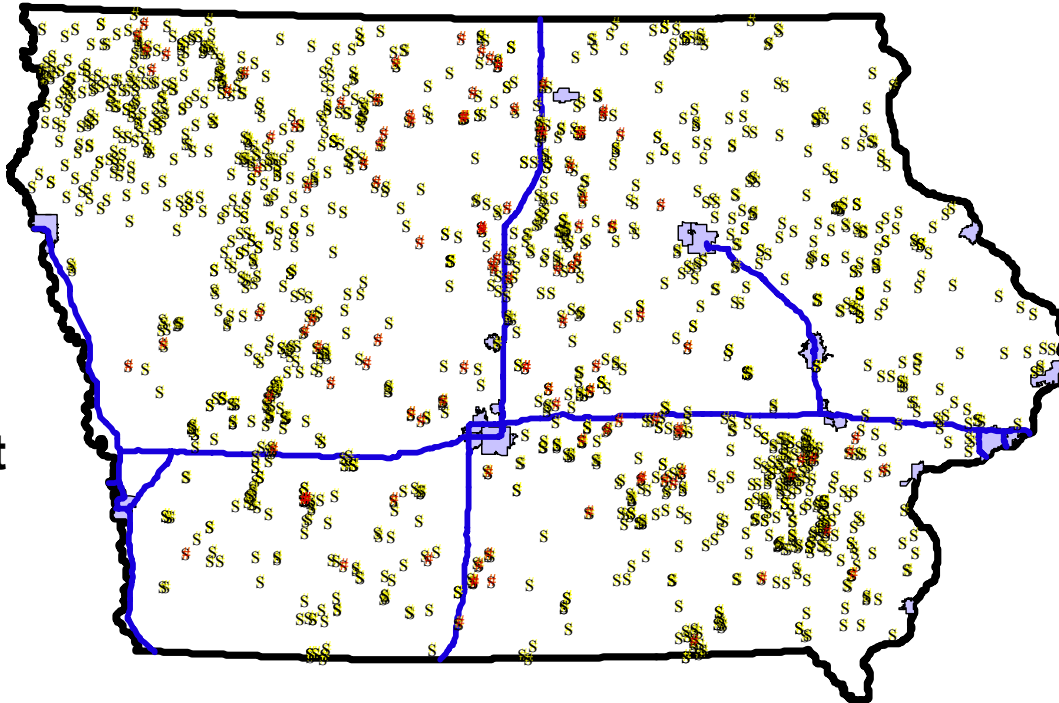
3. a. After the completion of the field study, the department may develop comprehensive plans and programs for the abatement, control, and prevention of airborne pollutants originating from animal feeding operations in accordance with this section. The comprehensive plans and programs may be developed if the baseline data from the field study demonstrates to a reasonable degree of scientific certainty that airborne pollutants emitted by an animal feeding operation are present at a separated location at levels commonly known to cause a material and verifiable adverse health effect.

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Overview

1708 odor measurements were taken by environmental specialists in the DNR field offices during 2003, 2004 and 2005.

**Odor Study
Measurement
Locations**



Scentometers

Scentometer-A device that dilutes odorous air with odor-free air to a specified ratio.



“Nasal Ranger” Scentometer



“Barneby Sutcliffe” Scentometer



Definition of an Odor Exceedance

" For the purposes of the odor study, an exceedance of the odor threshold at a monitoring location is determined if two odor readings separated by at least 15 minutes but not more than 1 hour both indicate that livestock odor is detectable at a seven to one dilution of odor free to ambient air."

(Similar to Wyoming's ambient air standard for odor:

http://deq.state.wy.us/aqd/stnd/Chapter2_2-3-05FINAL_CLEAN.pdf)



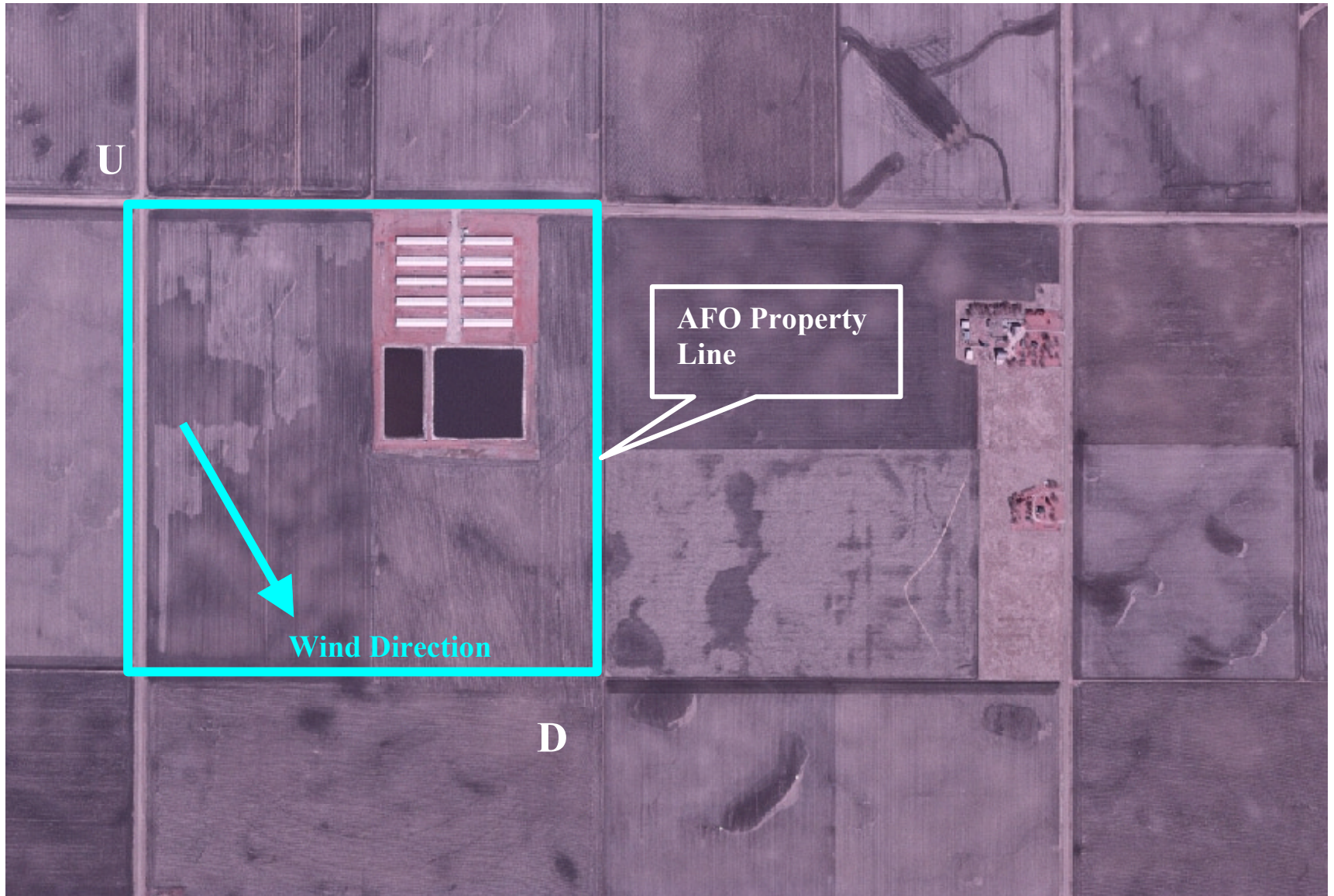
Measurement Types

Facility measurements-taken near the fence line of animal feeding operations

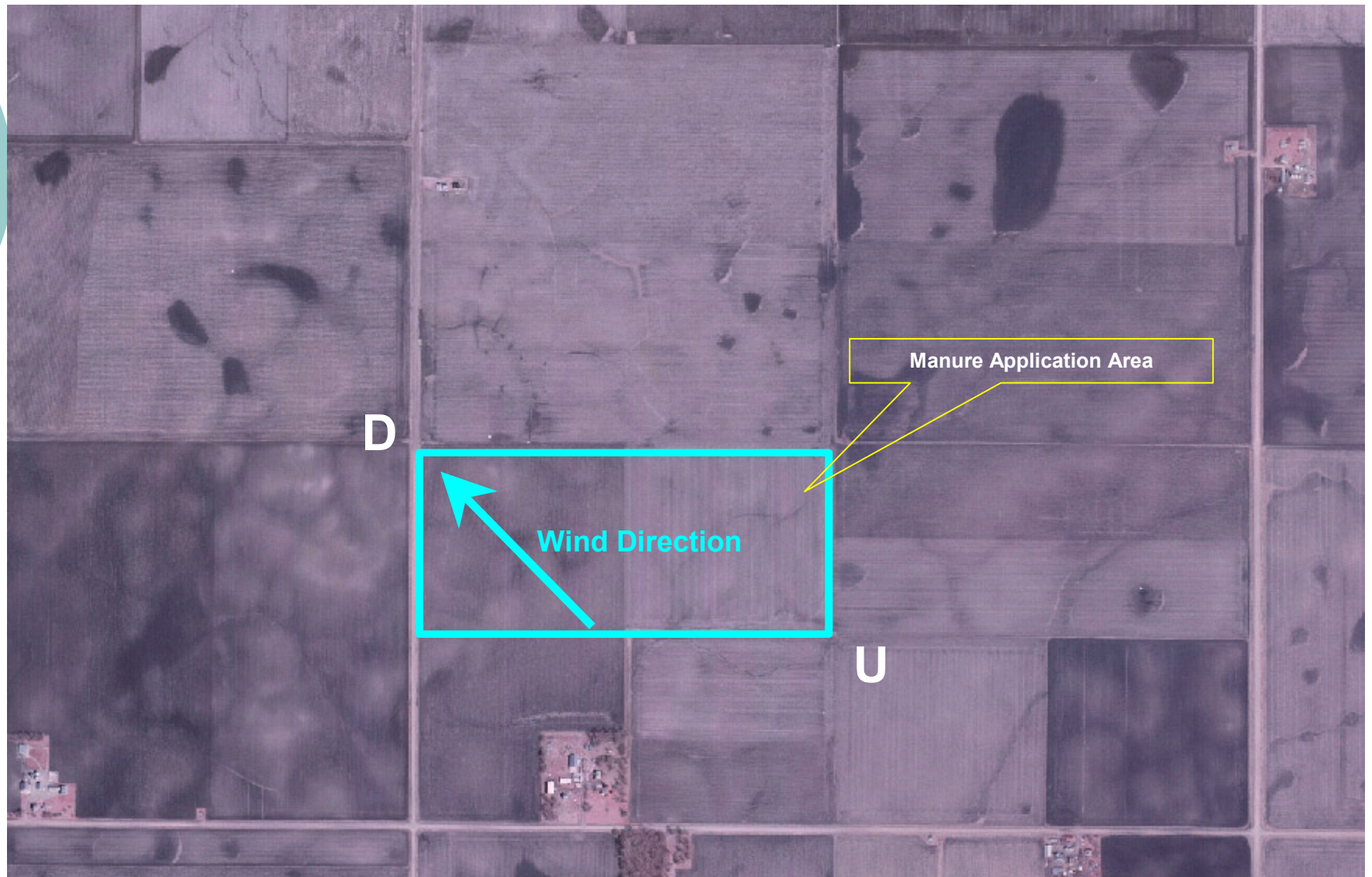
Manure application measurements-taken near the fence line of manure application areas

PERRC measurements-taken near
Public use areas,
Educational institutions,
Religious institutions,
Residences, or
Commercial enterprises

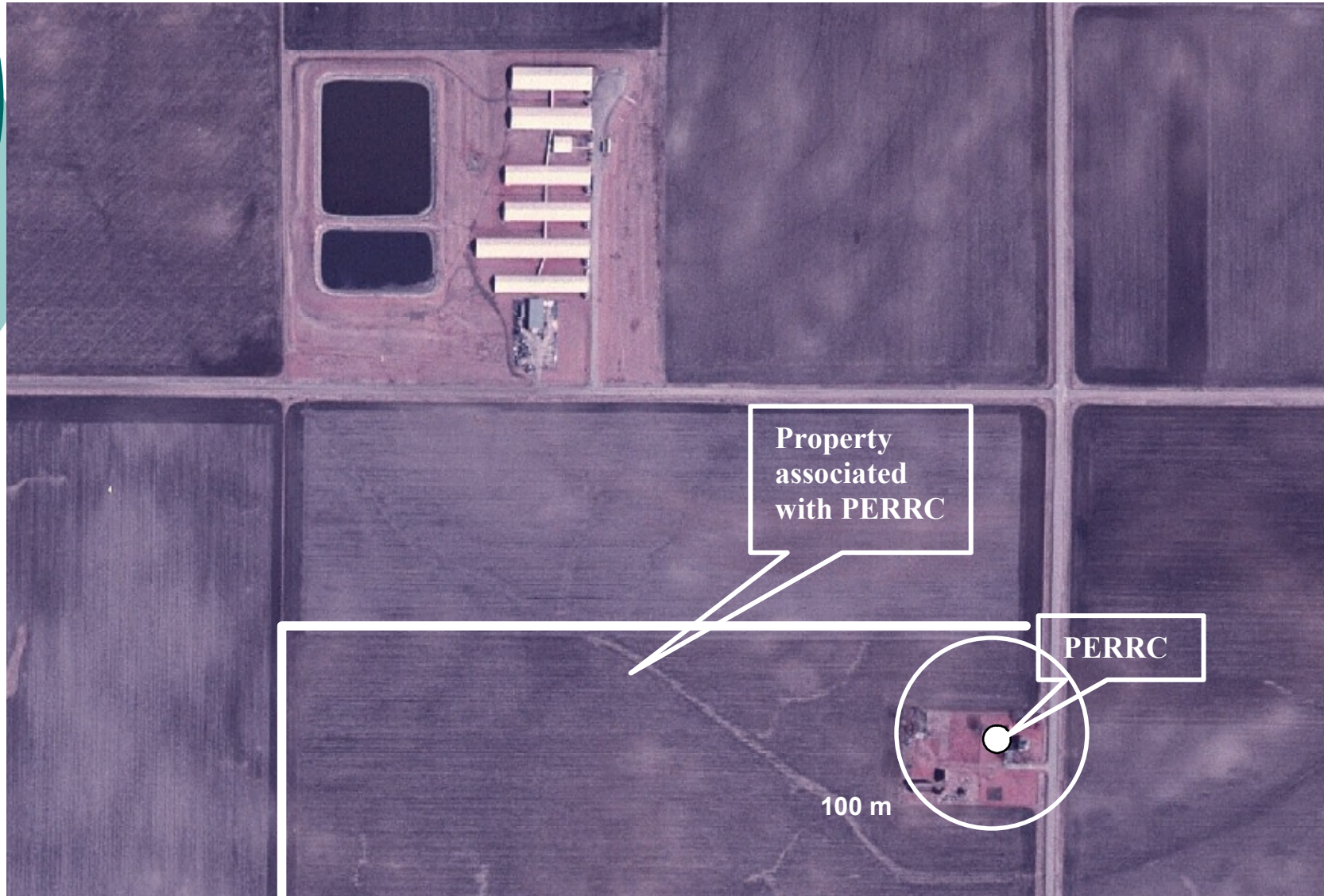
Facility Measurements



Manure Application Measurements



PERRC Measurements





Odor Study Results

Measurement Type	Exceedances	Measurements	Exceedance Rate
Facility	71	1066	7%
Manure Application	36	338	11%
PERRC	11	304	4%
Total	118	1708	7%



Odor Study Results (Continued)

- For the animal feeding operations monitored for the study,
 - operations that used deep pit storage had a lower exceedance rate than operations that used lagoons or tanks to store liquid manure
 - the exceedance rate was not simply correlated to the permitted size of the operation
- For the manure application areas monitored for the study,
 - injection of liquid manure resulted in a lower exceedance rate than land application of liquid manure with subsequent incorporation



Odor Study Results (Continued)

- For the PERRC's monitored for the study,
 - Eleven exceedances were measured. The department determined that one of these eleven exceedances was measured at a separated location. ("Separated location" is a location or object from which a separation distance is required when constructing a CAFO or applying manure.)



Conclusion

The comprehensive plans and programs may be developed if the baseline data from the field study demonstrates to a reasonable degree of scientific certainty that airborne pollutants emitted by an animal feeding operation are present at a separated location at levels commonly known to cause a material and verifiable adverse health effect.



For More Information

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Full Odor Study Report:

<http://www.iowadnr.gov/air/afo/files/Odor.pdf>

Additional Information on the CAFO field study:

<http://www.iowadnr.com/air/afo/afo.html>